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<120> GENETIC TRANSFORMATION USING A PARP INHIBITOR

<130> 2121-0127P

<140> 08/817,188

<141> 1997-05-15

<150> PCT/EP96/03366

<151> 1996-07-31

<150> EP 95401844.6

<151> 1995-08-04

<160> 5

<170> PatentIn Ver. 2.0

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<223> Description of Artificial Sequence: T-DNA of  
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<223> T-DNA right border (RB)

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T-DNA

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<213> Artificial Sequence

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<223> Description of Artificial Sequence: plasmid PTS172

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<223> P35S: 35S promoter region of Cauliflower Mosaic Virus

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 T-DNA

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<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: T72 promoter region

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<221> misc\_feature

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<223> promoter region of T72 gene of rice

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<222> Complement((803)..(1138))

<223> barnase: region coding for barnase

<220>

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<222> Complement((1138)..(2317))



<223> PCa55: stamen-specific promoter from corn gene  
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<221> misc\_feature

<222> (2355)..(3187)

<223> p35S: 35S promoter region of Cauliflower mosaic  
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<220>

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<222> (3188)..(3739)

<223> bar: region coding for phosphinoacetyl transferase

<220>

<221> misc\_feature

<222> (3757)..(4017)

<223> 3' nos: 3' untranslated region containing the  
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Agrobacterium T-DNA

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<222> (699)..(702)

<223> region with unknown sequence (may contain up to 15  
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T-DNA

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<220>  
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<222> (830)..(2760)  
<223> pSSU: promoter region of Rubisco small subunit  
gene of Arabidopsis thaliana

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<222> (2765)..(3058)  
<223> 3' untranslated region of the CaMV 35S transcript  
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<222> (3059)..(5056)  
<223> uidA: region coding for beta-glucuronidase

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<223> LB: left border sequence of octopine TL-DNA from  
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 tgaaaagtct caatannng tcgacctgca ggcattgcaag ctaattccgg ggaagcttag 5520  
 atccatggag ccatttacia ttgaatatat cctgccgccg 5560

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## SEQUENCE LISTING

## (1) GENERAL INFORMATION:

## (i) APPLICANT:

- (A) NAME: PLANT GENETIC SYSTEMS N.V.  
(B) STREET: Plateaustraat 22  
(C) CITY: Ghent  
(E) COUNTRY: Belgium  
(F) POSTAL CODE (ZIP): 9000  
(G) TELEPHONE: 32 9 235 84 58  
(H) TELEFAX: 32 9 223 19 23  
(I) TELEX: 11.361 Pgsgen

(ii) TITLE OF INVENTION: Genetic Transformation using a PARP inhibitor

(iii) NUMBER OF SEQUENCES: 5

## (iv) COMPUTER READABLE FORM:

- (A) MEDIUM TYPE: Floppy disk  
(B) COMPUTER: IBM PC compatible  
(C) OPERATING SYSTEM: PC-DOS/MS-DOS  
(D) SOFTWARE: PatentIn Release #1.0, Version #1.30 (EPO)

## (2) INFORMATION FOR SEQ ID NO: 1:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 4946 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: double  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: NO

## (vi) ORIGINAL SOURCE:

(A) ORGANISM: T-DNA of plasmid pTHW107

## (ix) FEATURE:

- (A) NAME/KEY: -  
(B) LOCATION: complement (1..25)  
(D) OTHER INFORMATION: /label= RB  
/note= "T-DNA right border"

## (ix) FEATURE:

- (A) NAME/KEY: -  
(B) LOCATION: complement (97..330)  
(D) OTHER INFORMATION: /label= 3'g7

/note= "3' untranslated region containing the  
polyadenylation signal of gene 7 of Agrobacterium T-DNA "



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## (ix) FEATURE:

(A) NAME/KEY: -  
 (B) LOCATION:complement (331..882)  
 (D) OTHER INFORMATION:/label= bar  
 /note= "region coding for phosphinothricin acetyl  
 transferase"

## (ix) FEATURE:

(A) NAME/KEY: -  
 (B) LOCATION:complement (883..2608)  
 (D) OTHER INFORMATION:/label= PSSU  
 /note= "promoter region of Rubisco small subunit gene of  
 Arabidopsis thali..."

## (ix) FEATURE:

(A) NAME/KEY: -  
 (B) LOCATION:complement (2658..3031)  
 (D) OTHER INFORMATION:/label= 3'nos  
 /note= "3' untranslated region containing the  
 polyadenylation signal of the nopaline synthase gene of Agrobacterium  
 T-DNA"

## (ix) FEATURE:

(A) NAME/KEY: -  
 (B) LOCATION:complement (3032..3367)  
 (D) OTHER INFORMATION:/label= barnase  
 /note= "region coding for barnase"

## (ix) FEATURE:

(A) NAME/KEY: -  
 (B) LOCATION:complement (3368..4876)  
 (D) OTHER INFORMATION:/label= PTA29  
 /note= "promoter region of TA29 gene of Nicotiana tabacum"

## (ix) FEATURE:

(A) NAME/KEY: -  
 (B) LOCATION:complement (4922..4946)  
 (D) OTHER INFORMATION:/label= LB  
 /note= "T-DNA left border"

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 1:

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ATATTTATTG ATAAAATAAC AAGTCAGGTA TTATAGTCCA AGCAAAAACA TAAATTTATT	180
GATGCAAGTT TAAATTCAGA AATATTTCAA TAACTGATTA TATCAGCTGG TACATTGCCG	240
TAGATGAAAG ACTGAGTGCG ATATTATGTG TAATACATAA ATTGATGATA TAGCTAGCTT	300
AGCTCATCGG GGGATCCTAG ACGCGTGAGA TCAGATCTCG GTGACGGGCA GGACCGGACG	360

GGGCGGTACC GGCAGGCTGA AGTCCAGCTG CCAGAAACCC ACGTCATGCC AGTTCCCGTG 420  
CTTGAAGCCG GCCGCCCGCA GCATGCCGCG GGGGGCATAT CCGAGCGCCT CGTGCATGCC 480  
CACGCTCGGG TCGTTGGGCA GCGCGATGAC AGCGACCACG CTCTTGAAGC CCTGTGCCTC 540  
CAGGGACTTC AGCAGGTGGG TGTAGAGCGT GGAGCCCAGT CCCGTCCGCT GGTGGCGGGG 600  
GGAGACGTAC ACGGTCGACT CGGCCGTCCA GTCGTAGGCG TTGCGTGCCT TCCAGGGGCC 660  
CGCGTAGGCG ATGCCGGCGA CCTCGCCGTC CACCTCGGCG ACGAGCCAGG GATAGCGCTC 720  
CCGCAGACGG ACAGAGTCTG CCGTCCACTC CTGCGTTTCC TCGGCTCGG TACGGAAGTT 780  
GACCGTGCTT GTCTCGATGT AGTGGTTGAC GATGGTGCAG ACCGCCGGCA TGTCCGCCTC 840  
GGTGGCACGG CGGATGTCGG CCGGGCGTCG TTCTGGGTCC ATTGTTCTTC TTTACTCTTT 900  
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AACAAGCTTT GGAGTGATCG GAGGGTCTAG GATACATGAG ATTCAAGTGG ACTAGGATCT 1020  
ACACCGTTGG ATTTTGAGTG TGGATATGTG TGAGGTTAAT TTTACTTGGT AACGGCCACA 1080  
AAGGCCTAAG GAGAGGTGTT GAGACCCTTA TCGGCTTGAA CCGCTGGAAT AATGCCACGT 1140  
GGAAGATAAT TCCATGAATC TTATCGTTAT CTATGAGTGA AATTGTGTGA TGGTGGAGTG 1200  
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GGTGAAACTG TGGAATATAT ATTTTTCAT TTTAAAAGCA AAATTTGCCT TTTACTAGAA 1440  
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CTATACACAA AACAAGTCAG ATAAATCTCT TTCTGGGCCT GTCTTCCCA CCTCCTACAT 1800  
CACTTCCCTA TCGGATTGAA TGTTTTACTT GTACCTTTTC CGTTGCAATG ATATTGATAG 1860  
TATGTTTGTG AAAACTAATA GGGTTAACAA TCGAAGTCAT GGAATATGGA TTTGGTCCAA 1920  
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5 CACCAATTAG GTTCTTATT ATGTGCCAAA TTCAATATAA TTATAGAGGA TATTTCAAAT 2040  
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10 ATATTTGTTT TGGCCATGCA CCAACTCATT GTTGTAGTGA ATACTTTGAT TTTGTCAAAT 2280  
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15 TAGTGCATTT TTTCTAACAA CCATATATGT TGCGATTGAT CTGCAAAAAT ACTGCTAGAG 2460  
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25 TAGTTTGCGC GCTATATTTT GTTTTCTATC GCGTATTAAA TGTATAATTG CGGGACTCTA 2760  
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35 AAACGGCCTC CGCAGGAAGC CGTTTTTTTC GTTATCTGAT TTTTGTAAG GTCTGATAAT 3060  
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40 TGCCTTCCCT GTTTGAGAAG ATGTCTCCGC ~~CGATGCTTTT~~ CCCC GGAGCG ACGTCTGCAA 3240  
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45 CAGGTAGCTT ATGATATGTC TGAAGATAAT CCGCAACCCC GTCAAACGTG TTGATAACCG 3360  
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55 AATTTTGTCT CACCCTGATT TCAGTTATGG AAATTACATT ATGAAGCTGT GCTAGAGAAG 3660

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ATGTTTATTC TAGTCCAGCC ACCCACCTTA TGCAAGTCTG CTTTGTAGCTT GATTCAAAAA 3720  
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AATGTATATT ATATGCATAA TTTATATATT AATCATGTAT AATCAATGTA 4800  
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ATCCCTAATA TAATCGCGAC GGATCCCCGG GAATTCGGG GAAGCTTAGA TCCATGGAGC 4920  
CATTTACAAT TGAATATATC CTGCCG 4946

(2) INFORMATION FOR SEQ ID NO: 2:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 6548 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: double  
(D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

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(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: NO

5 (vi) ORIGINAL SOURCE:  
(A) ORGANISM: plasmid pTS172

(ix) FEATURE:  
10 (A) NAME/KEY: -  
(B) LOCATION: complement (2019..2288)  
(D) OTHER INFORMATION: /label= 3'nos  
/note= "3' untranslated region containing the  
polyadenylation signal of the nopaline synthase gene of Agrobacterium  
T-DNA"

15 (ix) FEATURE:  
(A) NAME/KEY: -  
(B) LOCATION: complement (2289..2624)  
(D) OTHER INFORMATION: /label= barnase  
/note= "region coding for barnase"

20 (ix) FEATURE:  
(A) NAME/KEY: -  
(B) LOCATION: complement (2625..4313)  
(D) OTHER INFORMATION: /label= PE1  
/note= "promoter region of E1 gene of rice"

25 (ix) FEATURE:  
(A) NAME/KEY: -  
(B) LOCATION: 4336..5710  
(D) OTHER INFORMATION: /label= P35S  
/note= "35S promoter region of Cauliflower mosaic virus"

30 (ix) FEATURE:  
(A) NAME/KEY: -  
(B) LOCATION: 5711..6262  
(D) OTHER INFORMATION: /label= bar  
/note= "region coding for phosphinothricin acetyl  
transferase"

35 (ix) FEATURE:  
(A) NAME/KEY: -  
(B) LOCATION: 6263..6496  
(D) OTHER INFORMATION: /label= 3'g7  
/note= "3' untranslated region containing the  
polyadenylation signal of gene 7 of Agrobacterium T-DNA"

40 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 2:

50 AATTCAAGCT TGACGTCAGG TGGCACTTTT CGGGGAAATG TCGCGGGAAC CCCTATTTGT 60  
TTATTTTCT AAATACATTC AAATATGTAT CCGCTCATGA GACAATAACC CTGATAAATG 120  
55 CTTCAATAAT ATTGAAAAAG GAAGAGTATG AGTATTCAAC ATTTCCGTGT CGCCCTTATT 180

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CCCTTTTTTG CGGCATTTTG CCTTCCTGTT TTTGCTCACC CAGAAACGCT GGTGAAAGTA 240  
AAAGATGCTG AAGATCAGTT GGGTGCACGA GTGGGTACGA TCGAACTGGA TCTCAACAGC 300  
GGTAAGATCC TTGAGAGTTT TCGCCCCGAA GAACGTTTTT CAATGATGAG CACTTTTAAA 360  
GTTCTGCTAT GTGGCGCGGT ATTATCCCGT ATTGACGCCG GGCAAGAGCA ACTCGGTCGC 420  
CGCATACACT ATTCTCAGAA TGAAGTGGTT GAGTACTCAC CAGTCACAGA AAAGCATCTT 480  
ACGGATGGCA TGACAGTAAG AGAATTATGC AGTGCTGCCA TAACCATGAG TGATAACACT 540  
GCGGCCAACT TACTTCTGAC AAGGATCGGA GGACCGAAGG AGCTAACCGC TTTTTTGCAC 600  
AACATGGGGG ATCATGTAAC TCGCCTTGAT CGTTGGGAAC CGGAGCTGAA TGAAGCCATA 660  
CCAAACGACG AGCGTGACAC CACGATGCCT GTAGCAATGG CAACAACGTT GCGCAAATA 720  
TTAACTGGCG AACTACTTAC TCTAGCTTCC CGGCAACAAT TAATAGACTG GATGGAGGCG 780  
GATAAAGTTG CAGGACCACT TCTGCGCTCG GCCCTTCCGG CTGGCTGGTT TATTGCTGAT 840  
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AAGCCCTCCC GTATCGTAGT TATCTACAGC ACGGGGAGTC AGGCAACTAT GGATGAACGA 960  
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CCTACATACC TCGCTCTGCT AATCCTGTTA CCAGTGGCTG CTGCCAGTGG CGATAAGTCG 1440  
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TGCTCGTCAG GGGGGCGGAG CCTATGGAAA AACGCCAGCA ACGCGGCTT TTTACGGTTC 1800

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CTGGCCTTTT GCTGGCCTTT TGCTCACATG TTCTTTCCTG CGTTATCCCC TGATTCTGTG 1860  
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5 CGCAGCGAGT CAGTGAGCGA GGAAGCGGAA GAGCGCCCAA TACGCAAACC GCCTCTCCCC 1980  
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10 CCGCGCGCGA TAATTTATCC TAGTTTGCGC GCTATATTTT GTTTTCTATC GCGTATTAAA 2100  
TGTATAATTG CGGGACTCTA ATCATAAAAA CCCATCTCAT AAATAACGTC ATGCATTACA 2160  
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15 CGGCAACAGG ATTCAATCTT AAGAACTTT ATTGCCAAAT GTTTGAACGA TCTGCTTCGG 2280  
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CAGTCGCTTG AGTAAAGAAT CCGGTCTGAA TTTCTGAAGC CTGATGTATA GTTAATATCC 2400  
20 GCTTCACGCC ATGTTCTGCC GCTTTTGCCC GGGAGTTTGC CTTCCCTGTT TGAGAAGATG 2460  
TCTCCGCCGA TGCTTTTCCC CGGAGCGACG TCTGCAAGGT TCCCTTTTGA TGCCACCCAG 2520  
25 CCGAGGGCTT GTGCTTCTGA TTTTGTAAATG TAATTATCAG GTAGCTTATG ATATGTCTGA 2580  
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ATCTCTTGCT GGACACCGGG ATGCTAGGAT GGGTTATCGT GGCCGGCGTG CGTGTGTGGC 2700  
30 TTTTGTAGGC GCCGGCGACG GCGGGGGCAA TGTGGCAGGT GAGTCACGGT GCAAGCGTGC 2760  
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35 ACAGGATGTA GCAGTAGCAC GGTGAAAGAA GTGTTGTCCC GTCCATTAGG TGCATTCTCA 2880  
CCGTTGGCCA GAACAGGACC GTTCAACAGT TAGGTTGAGT GTAGGACTTT TACGTGGTTA 2940  
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40 TGGAAGCCT CTAGCATATC TTTTTTGACA GCTAACTTT GCTTCTTGCC TTCTTGGTCT 3060  
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45 CCTTCAACGG CTCAATCCCC ACAGGCCAAG CTATCCTTTC CTGCGCAGTA TAGGCTCCTT 3180  
GAGAGATTAT ACTACCATT TTAAGTGCTT ATAAAGACGA TGCTCTCTAA CCAGATCGAT 3240  
CAGAAACACA AAGTTTTAGC AGCGTAATAT CCCACACACA TACACACAG AAGCTATGCC 3300  
50 TCCTCATTTT CCGAGAGATT CTGACAGTGA CCAGAATGTC AGAATGCCAT TTCATGGGCA 3360  
CAAGTCGATC CACAAGCTTC TTGGTGGAGG TCAAGGTGTG CTATTATTAT TCGCTTTCTA 3420  
55 GGAAATTATT CAGAATTAGT GCCTTTTATC ATAATTCTC TCTGAGCCGA TGTGGTTTTG 3480

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GATTTTCATTG TTGGGAGCTA TGCAGTTGCG GATATTCTGC TGTGGAAGAA CAGGAACTTA 3540  
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TATTGGTATT GTCGGCGATT GGAAGTTCTT GCAGCTTGAC AAGTCTACTA TATATTGGTA 4260  
GGTATTCCAG ATAAATATTA AATTTTAATA AAACAATCAC ACAGAAGGAT CTGCGGCCGC 4320  
TAGCCTAGGC CCGGGCCCCAC AAAAATCTGA GCTTAACAGC ACAGTTGCTC CTCTCAGAGC 4380  
AGAATCGGGT ATTCAACACC CTCATATCAA CTACTACGTT GTGTATAACG GTCCACATGC 4440  
CGGTATATAC GATGACTGGG GTTGTAACAA GGCGGCAACA AACGGCGTTC CCGGAGTTGC 4500  
ACACAAGAAA TTTGCCACTA TTACAGAGGC AAGAGCAGCA GCTGACGCGT ACACAACAAG 4560  
TCAGCAAACA GACAGGTTGA ACTTCATCCC CAAAGGAGAA GCTCAACTCA AGCCCAAGAG 4620  
CTTTGCTAAG GCCCTAACAA GCCCACCAA GCAAAAAGCC CACTGGCTCA CGCTAGGAAC 4680  
CAAAAGGCC AGCAGTGATC CAGCCCCAAA AGAGATCTCC TTTGCCCCGG AGATTACAAT 4740  
GGACGATTTT CTCTATCTTT ACGATCTAGG AAGGAAGTTC GAAGGTGAAG GTGACGACAC 4800  
TATGTTCACT ACTGATAATG AGAAGGTTAG CCTCTTCAAT TTCAGAAAGA ATGCTGACCC 4860  
ACAGATGGTT AGAGAGGCCT ACGCAGCAGG TCTCATCAAG ACGATCTACC CGAGTAACAA 4920  
TCTCCAGGAG ATCAAATACC TTCCCAAGAA GGTAAAGAT GCAGTCAAAA GATTCAAGAC 4980  
TAATTGCATC AAGAACACAG AGAAAGACAT ATTTCTCAAG ATCAGAAGTA CTATTCCAGT 5040  
ATGGACGATT CAAGGCTTGC TTCATAAACC AAGGCAAGTA ATAGAGATTG GAGTCTCTAA 5100



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AAAGGTAGTT CCTACTGAAT ~~CTAAGGCCAT~~ GCATGGAGTC TAAGATTCAA ATCGAGGATC 5160  
TAACAGAACT CGCCGTGAAG ~~ACTGGCGAAC~~ AGTTCATACA GAGTCTTTTA CGACTCAATG 5220  
5 ACAAGAAGAA AATCTTCGTC ~~AACATGGTGG~~ AGCACGACAC TCTGGTCTAC TCCAAAAATG 5280  
TCAAAGATAC AGTCTCAGAA ~~GACCA~~AAGGG CTATTGAGAC TTTTCAACAA AGGATAATTT 5340  
10 CGGGAAACCT CCTCGGATTC CATTGCCCAG CTATCTGTCA CTTTCATCGAA AGGACAGTAG 5400  
AAAAGGAAGG TGGTCCTAC ~~AAATGCCATC~~ ATTGCGATAA AGGAAAGGCT ATCATTCAAG 5460  
ATGCCTCTGC CGACAGTGGT ~~CCCAAAGATG~~ GACCCCCACC CACGAGGAGC ATCGTGGA 5520  
15 AAGAAGACGT TCCAACCACG TCTTCAAAGC ~~AAGTGGATTG~~ ATGTGACATC TCCACTGACG 5580  
TAAGGGATGA CGACAATCC CACTATCCTT ~~CGCAAGACCC~~ TTCCTCTATA TAAGGAAGTT 5640  
CATTTCATTT GGAGAGGACA CGCTGAAATC ~~ACCAGTCTCT~~ CTCTATAAAT CTATCTCTCT 5700  
20 CTCTATAACC ATGGACCCAG AACGACGCCC ~~GGCCGACATC~~ CGCCGTGCCA CCGAGGCGGA 5760  
CATGCCGGCG GTCTGCACCA TCGTCAACCA ~~CTACATCGAG~~ ACAAGCACGG TCAACTTCCG 5820  
25 TACCGAGCCG CAGGAACCGC AGGAGTGGAC ~~GGACGACCTC~~ GTCCGTCTGC GGGAGCGCTA 5880  
TCCCTGGCTC GTCGCCGAGG TGGACGGCGA ~~GGTGCCCGGC~~ ATCGCCTACG CGGGCCCCTG 5940  
30 GAAGGCACGC AACGCCTACG ACTGGACGGC ~~CGAGTCGACC~~ GTGTACGTCT CCCCCGCCA 6000  
CCAGCGGACG GGAAGTGGGCT CCACGCTCTA ~~CACCCACCTG~~ CTGAAGTCCC TGGAGGCACA 6060  
GGGCTTCAAG AGCGTGGTCG CTGTCATCGG ~~GCTGCCCAAC~~ GACCCGAGCG TGCATGCA 6120  
35 CGAGGCGCTC GGATATGCCC CCCGCGGCAT ~~GCTGCGGGCG~~ GCCGGCTTCA AGCACGGGAA 6180  
CTGGCATGAC GTGGGTTTCT GGCAGCTGGA ~~CTTCAGCCTG~~ CCGGTACCGC CCCGTCCGGT 6240  
CCTGCCCCGTC ACCGAGATCT GAGATCACGC ~~GTTCTAGGAT~~ CCCCCGATGA GCTAAGCTAG 6300  
40 CTATATCATC AATTTATGTA TTACACATAA TATCGCACTC ~~AGTCTTTCAT~~ CTACGGCAAT 6360  
GTACCAGCTG ATATAATCAG TTATTGAAAT ATTTCTGAAT ~~TTAACTTGC~~ ATCAATAAAT 6420  
45 TTATGTTTTT GCTTGGAATA TAATACCTGA CTTGTTATTT ~~TATCAATAAA~~ TATTTAAACT 6480  
ATATTTCTTT CAAGATGGGA ATTAACATCT ACAAATTGCC TTTTCTTATC GACCATGTAC 6540  
50 GTATCGCG 6548

(2) INFORMATION FOR SEQ ID NO: 3:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 1601 base pairs

(B) TYPE: nucleic acid

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(C) STRANDEDNESS: double  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: NO

(vi) ORIGINAL SOURCE:

(A) ORGANISM: T72 promoter region

(ix) FEATURE:

(A) NAME/KEY: -

(B) LOCATION: complement (1..1601)

(D) OTHER INFORMATION: /label= PT72

/note= "promoter region of T72 gene of rice"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 3:

CGCCGTGAGT	GTCTTCTGCC	GCCGAGGGGC	TCTCGCTCGT	CGTCGATGCC	TGCACGGTGC	60
GTGCGTGTGT	GTCGTGGTGG	TGGTGCGGAT	ACGCGACGCG	AGCTCGATTT	ATAGGAGGGG	120
ATCGAAGGAG	GGGAGCGCGC	GCGGCGAGGC	CCGCGTTGCT	CACCTACGCC	GCGCGCATGC	180
GGCGGACGCG	CGGTCGGCGC	CCGCGCCGGC	CGGGAGGACG	AGGGCGCAAG	CGTGTGAGCC	240
ACCGAACGCG	CGCGCGCGCC	GCGGCGCGAA	CTCTCCATCG	CGTCGCGGCG	AGCCGAGAGC	300
CGACGAGAGC	GTTTCGCGCG	CGCGGTTGGG	CCGCGGACAA	GATGGGCCGT	AGCCCTGGGC	360
CTCGTGCCAT	CTTTTTTTTT	CTTTTTTGCC	TTTTTTGGCC	TGGCAATTTT	TTTTTGTTTT	420
TAGTCTTTTT	GTGGTGATAA	TGTGTCGTCT	TCCGGTGAAC	TAATTTACTC	GTTGATCTTT	480
TTGTGTCCCT	TCGAATATTC	GCAGTGGTAG	AAGATGACTA	CTACTACCAG	TAGTTGATCT	540
CGAATGGCAA	CTTTTGTGCA	GAACTTATTC	CACGGCTATG	TCAGCTTCCA	CTGTGACTAA	600
AAAAACTACG	GCCATCTTTT	GGACTTGTTT	TATCTTGGA	CTGAACAAAA	AGGACGATCC	660
TGATGTACAC	ACGGCATAGT	TTCCAGCACT	GGATGCCAAG	TTGCCAACTG	TTACCACGAT	720
AATGGAACGA	CGAGATGAGA	TATTATACAA	GTCCAATGGA	TCGAAGATCCT	GTGCAGTTGT	780
TATTGTAACT	GTAACCTAAG	CCGTAAACAT	GTACATCACA	TTTCCTACTC	TATCAATGTC	840
TTGTGCGGGT	TGTTTCAAAA	AAACATGTAC	ATCACATGAT	CTAGAACGGA	AGGCCAGGAT	900
ATGAAGTGGT	ACTGCAGCAA	AAACACTGTA	GCAGAGATGT	ACTATTATGC	ATGTACTGTA	960
GCAGTCATCT	AGAGCCGTTG	GATCTGAAAA	CGAATGGACA	TGATTGTGTG	CAGTTGCTAT	1020

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TGTGCAGTTA CAATAGCAAC TGCATTTGAT CTTAATCCAA GTCCAATACA TGCAGAACAG 1080  
TAGCTACGAG CTGGAAAGGA TGCAAATCTG GGTGACACTG ACAGCAACCG TGGAAGAACA 1140  
5 ACAGCAGCAA AGTCCCAGAG GGATGGCAAT TTGAAGGAAT TTAAATACTC TAATATTACT 1200  
CCACCCGTTA AAAAAAACAA CTGCTACGC ATAATATATG TTCGGATTTA TAGCGAGAAG 1260  
TTAATTTTTTC ATGAGAAGAA GAATATATAT GTAATATGTA CTAGGAGAGT ACTCGCTTCA 1320  
10 TAAATATAAA TATTCATAAG TTGTCCAGTG AAGATAGCTT TAGAAAAAAC TAGTTATTTT 1380  
ATTTGTCAAA TTTTAAATTT TGAAGTAGTT AGATTATCTT TCTAGTAGTT CTGATTGGTT 1440  
15 GAAAATGTTT AGATTTTCAT GTGTTAAGAG TTCCGTATCC TAAAAATAGT AATATAATTT 1500  
TAAATCATAT ATATATATAT ATATATATAT ATATATATAT ATATATATAT ATATATATAT 1560  
TGTTGAACGG TTTGTGCTCT GGTGCTATC CTGTTCTGTG G 1601

## (2) INFORMATION FOR SEQ ID NO: 4:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 6291 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: circular

## (ii) MOLECULE TYPE: DNA (genomic)

## (iii) HYPOTHETICAL: NO

## (iv) ANTI-SENSE: NO

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: plasmid pVE136

## (ix) FEATURE:

- (A) NAME/KEY: -
- (B) LOCATION: complement (425..637)
- (D) OTHER INFORMATION: /label= 3'nos

/note= "3'untranslated region containing the  
polyadenylation signal of the nopaline synthase gene of Agrobacterium  
T-DNA"

## (ix) FEATURE:

- (A) NAME/KEY: -
- (B) LOCATION: complement (803..1138)
- (D) OTHER INFORMATION: /label= barnase
- /note= "region coding for barnase"

## (ix) FEATURE:

- (A) NAME/KEY: -
- (B) LOCATION: complement (1138..2317)
- (D) OTHER INFORMATION: /label= PCa55

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/note= "stamen-specific promoter from corn gene CA55"

## (ix) FEATURE:

(A) NAME/KEY: -  
(B) LOCATION: 2355..3187  
(D) OTHER INFORMATION: /label= P35S  
/note= "35S promoter region of Cauliflower mosaic virus"

## (ix) FEATURE:

(A) NAME/KEY: -  
(B) LOCATION: 3188..3739  
(D) OTHER INFORMATION: /label= bar  
/note= "region coding for phosphotransferase"

transferase"

## (ix) FEATURE:

(A) NAME/KEY: -  
(B) LOCATION: 3757..4017  
(D) OTHER INFORMATION: /label= 3'nos  
/note= "3' untranslated region containing the  
polyadenylation  
signal of the nopaline synthase gene of Agrobacterium  
T-DNA"

polyadenylation

T-DNA"

## (ix) FEATURE:

(A) NAME/KEY: -  
(B) LOCATION: 699..702  
(D) OTHER INFORMATION: /note= "region with unknown  
sequence (may contain up to 15 nucleotides)"

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 4:

TCGCGCGTTT	CGGTGATGAC	GGTGAAACC	TCTGACACAT	GCAGCTCCCG	GAGACGGTCA	60
CAGCTTGTCT	GTAAGCGGAT	GCCGGGAGCA	GACAAGCCCG	TCAGGGCGCG	TCAGCGGGTG	120
TTGGCGGGTG	TCGGGGCTGG	CTTAACATG	CGGCATCAGA	GCAGATTGTA	CTGAGAGTGC	180
ACCATATGCG	GTGTGAAATA	CCGCACAGAT	GCGTAAGGAG	AAAATACCGC	ATCAGGCGCC	240
ATTCGCCATT	CAGGCTGCGC	AACTGTTGGG	AAGGGCGATC	GGTGCGGGCC	TCTTCGCTAT	300
TACGCCAGCT	GGCGAAAGGG	GGATGTGCTG	CAAGGCGATT	AACTTGGGTA	ACGCCAGGGT	360
TTTCCCAGTC	ACGACGTTGT	AAAACGACGG	CCAGTGAATT	CGAGCTCGGT	ACCCGGGGAT	420
CTTCCCGATC	TAGTAACATA	GATGACACCG	CGCGCGATAA	TTTATCCTAG	TTTGC GCGCT	480
ATATTTTGTT	TTCTATCGCG	TATTAAATGT	ATAATTGCGG	GACTCTAATC	ATAAAAACCC	540
ATCTCATAAA	TAACGTCATG	CATTACATGT	TAATTATTAC	ATGCTTAACG	TAATTCAACA	600
GAAATTATAT	GATAATCATC	GCAAGACCGG	CAACAGGATT	CAATCTTAAG	AAACTTTATT	660

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GCCAAATGTT TGAACGATCT GCTTCGGATC CTCTAGAGNN NNCCGGAAAG TGAAATTGAC 720  
CGATCAGAGT TTGAAGAAAA ATTTATTACA CACTTTATGT AAAGCTGAAA AAAACGGCCT 780  
CCGCAGGAAG CCGTTTTTTT CGTTATCTGA TTTTGTAAA GGTCTGATAA TGGTCCGTTG 840  
TTTTGTAAAT CAGCCAGTCG CTTGAGTAAA GAATCCGGTC TGAATTTCTG AAGCCTGATG 900  
TATAGTTAAT ATCCGCTTCA CGCCATGTTT GTCCGCTTTT GCCCGGGAGT TTGCCTTCCC 960  
TGTTTGAGAA GATGTCTCCG CCGATGCTTT TCCCCGGAGC GACGTCTGCA AGGTTCCTT 1020  
TTGATGCCAC CCAGCCGAGG GCTTGTGCTT CTGATTTTGT AATGTAATTA TCAGGTAGCT 1080  
TATGATATGT CTGAAGATAA TCCGCAACCC CGTCAAACGT GTTGATAACC GGTACCATGG 1140  
CTGCAGCTAG TTAGCTCGAT GTATCTTCTG TATATGCACT GCAGCTTCTG CGTTTTGGCT 1200  
GCTTTGAGCT GTGAAATCTC GCTTTCCAGT CCCTGCGTGT TTTATAGTGC TGTACGTTCTG 1260  
TGATCGTGAG CAAACAGGGC GTGCCTCAAC TACTGGTTTG GTTGGGTGAC AGGCGCCAAC 1320  
TACGTGCTCG TAACCGATCG AGTGAGCGTA ATGCAACATT TTTTCTTCTT CTCTCGCATT 1380  
GGTTTCATCC AGCCAGGAGA CCCGAATCGA ATTGAAATCA CAAATCTGAG GTACAGTATT 1440  
TTTACAGTAC CGTTCGTTTC AAGGTCTTCG ACAGSTCAAG GTAACAAAAT CAGTTTTAAA 1500  
TTGTTGTTTC AGATCAAAGA AAATTGAGAT GATCTGAAGG ACTTGGACCT TCGTCCAATG 1560  
AAACACTTGG ACTAATTAGA GGTGAATTGA AAGCAAGCAG ATGCAACCGA AGGTGGTGAA 1620  
AGTGGAGTTT CAGCATTGAC GACGAAAACC TTCGAACGGT ATAAAAAAGA AGCCGCAATT 1680  
AAACGAAGAT TTGCCAAAA GATGCATCAA CCAAGGGAAG ACGTGCATAC ATGTTTGATG 1740  
AAAACGTA AAAACTGAAG TACGATTCCC CATTCCCCTC CTTTTCTCGT TTCTTTTAAC 1800  
TGAAGCAAAG AATTTGTATG TATCCCTCC ATTCCATATT CTAGGAGGTT TTGGCTTTTC 1860  
ATACCCTCCT CCATTTCAA TTATTTGTCA TACATTGAAG ATATACACCA TTCTAATTTA 1920  
TACTAAATTA CAGCTTTTAG ATACATATAT TTTATTATAC ACTTAGATAC GTATTATATA 1980  
AAACACCTAA TTAAAATAA AAAATTATAT AAAAGTGTA TCTAAAAAAT CAAAATACGA 2040  
CATAATTTGA AACGGAGGGG TACTACTTAT GCAAACCAAT CGTGGTAACC CTAAACCCTA 2100  
TATGAATGAG GCCATGATTG TAATGCACCG TCTGATTAAC CAAGATATCA ATGGTCAAAG 2160  
ATATACATGA TACATCCAAG TCACAGCGAA GGCAAATGTG ACAACAGTTT TTTTACCAG 2220  
AGGGACAAGG GAGAATATCT ATTCAGATGT CAAGTTCCCG TATCACACTG CCAGGTCCTT 2280  
ACTCCAGACC ATCTTCCGGC TCTATTGATG CATACCAGGA ATTGATCTAG AGTCGACCTG 2340

	CAGGCATGCA AGCTCCTACG CAGCAGGTCT CATCAAGACG ATCTACCCGA GTAACAATCT	2400
5	CCAGGAGATC AAATACCTTC CCAAGAAGGT TAAAGATGCA GTCAAAAGAT TCAGGACTAA	2460
	TTGCATCAAG AACACAGAGA AAGACATATT TCTCAAGATC AGAAGTACTA TTCCAGTATG	2520
	GACGATTCAA GGCTTGCTTC ATAAACCAAG GCAAGTAATA GAGATTGGAG TCTCTAAAAA	2580
10	GGTAGTTCCT ACTGAATCTA AGGCCATGCA TGGAGTCTAA GATTCAAATC GAGGATCTAA	2640
	CAGAACTCGC CGTGAAGACT GGCGAACAGT TCATACAGAG TCTTTTACGA CTCAATGACA	2700
15	AGAAGAAAAT CTTGTCACAC ATGGTGGAGC ACGACACTCT GGTCTACTCC AAAAATGTCA	2760
	AAGATACAGT CTCAGAAGAC CAAAGGGCTA TTGAGACTTT TCAACAAAGG ATAATTTCCG	2820
	GAAACCTCCT CGGATTCCAT TGCCCGAGCTA TCTGTCACTT CATCGAAAGG ACAGTAGAAA	2880
20	AGGAAGGTGG CTCCTACAAA TGCCATCATT GCGATAAAGG AAAGGCTATC ATTCAAGATG	2940
	CCTCTGCCGA CAGTGGTCCC AAAGATGGAC CCCCACCCAC GAGGAGCATC GTGGAAAAAG	3000
25	AAGACGTTCC AACCACGTCT TCAAAGCAAG TGGATTGATG TGACATCTCC ACTGACGTAA	3060
	GGGATGACGC ACAATCCCAC TATCCTTCGC AAGACCCTTC CTCTATATAA GGAAGTTCAT	3120
	TTCATTTGGA GAGGACACGC TGAAATCACC AGTCTCTCTC TATAAATCTA TCTCTCTCTC	3180
30	TATAACCATG GACCCAGAAC GACGCCCCGC CGACATCCGC CGTGCCACCG AGGCGGACAT	3240
	GCCGGCGGTC TGCACCATCG TCAACCACTA CATCGAGACA AGCACGGTCA ACTTCCGTAC	3300
35	CGAGCCGCAG GAACCGCAGG AGTGGACGGA CGACCTCGTC CGTCTGCGGG AGCGCTATCC	3360
	CTGGCTCGTC GCCGAGGTGG ACGGCGAGGT CGCCGGGCATC GCCTACGCGG GCCCCTGGAA	3420
	GGCACGCAAC GCCTACGACT GGACGGCCGA GTCGACCTG TACGTCTCCC CCCGCCACCA	3480
40	GCGGACGGGA CTGGGCTCCA CGCTCTACAC CCACCTCTG AAGTCCCTGG AGGCACAGGG	3540
	CTTCAAGAGC GTGGTCGCTG TCATCGGGCT GCCCAACGAC CCGAGCGTGC GCATGCACGA	3600
45	GGCGCTCGGA TATGCCCCC GCGGCATGCT GCGGGCGGCC GGCTTCAAGC ACGGGAAGT	3660
	GCATGACGTG GGTTCCTGGC AGCTGGACTT CAGCCTGCCG GTACCGCCCC GTCCGGTCCT	3720
	GCCCGTCACC GAGATCTGAT CTCACGCTC TAGGATCCGA AGCAGATCGT TCAAACATTT	3780
50	GGCAATAAAG TTTCTTAAGA TTGAATCCTG TTGCCGGTCT TGCGATGATT ATCATATAAT	3840
	TTCTGTTGAA TTACGTTAAG CATGTAATAA TTAACATGTA ATGCATGACG TTATTTATGA	3900
55	GATGGGTTTT TATGATTAGA GTCCCGCAAT TATACATTTA ATACGCGATA GAAAACAAAA	3960

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TATAGCGCGC AACTAGGAT AAATTATCGC GCGCGGTGTC ATCTATGTTA CTAGATCGGG 4020  
AAGATCCTCT AGAGTCGACC TSCAGGCATG CAAGCTTGGC GTAATCATGG TCATAGCTGT 4080  
TTCCTGTGTG AAATTGTTAT CCGCTCACAA TTCCACACAA CATACGAGCC GGAAGCATAA 4140  
AGTGTAAGC CTGGGGTGCC TAATGAGTGA GCTAACTCAC ATTAATTGCG TTGCGCTCAC 4200  
TGCCCGCTTT CCAGTCGGGA AACCTGTCGT GCCAGCTGCA TTAATGAATC GGCCAACGCG 4260  
CGGGGAGAGG CGGTTTTCGT ATTGGGCGCT CTTCCGCTTC CTCGCTCACT GACTCGCTGC 4320  
GCTCGGTCTG TCGGCTGCGG CGAGCGGTAT CAGCTCACTC AAAGGCGGTA ATACGGTTAT 4380  
CCACAGAATC AGGGGATAAC GCAGGAAAGA ACATGTGAGC AAAAGGCCAG CAAAAGGCCA 4440  
GGAACCGTAA AAAGGCCGCG TTGCTGGCGT TTTTCCATAG GCTCCGCCCC CCTGACGAGC 4500  
ATCACAAAAA TCGACGCTCA AGTCAGAGGT GGCGAAACCC GACAGGACTA TAAAGATACC 4560  
AGGCGTTTCC CCCTGGAAGC TCCCTCGTGC GCTCTCTGT TCCGACCTG CCGCTTACCG 4620  
GATACCTGTC CGCCTTTCTC CCTTCGGGAA GCGTGGCGCT TTCTCAATGC TCACGCTGTA 4680  
GGTATCTCAG TTCGGTGTAG GTCGTTGCT CCAAGCTGGG CTGTGTGCAC GAACCCCCCG 4740  
TTCAGCCCGA CCGCTGCGCC TTATCCGGTA ACTATCGTCT TGAGTCCAAC CCGGTAAGAC 4800  
ACGACTTATC GCCACTGGCA GCAGCCACTG GTAACAGGAT TAGCAGAGCG AGGTATGTAG 4860  
GCGGTGCTAC AGAGTTCTTG AAGTGGTGGC CTAACAGG CTACACTAGA AGGACAGTAT 4920  
TTGGTATCTG CGCTCTGCTG AAGCCAGTTA CCTTCGGAAA AAGAGTTGGT AGCTCTTGAT 4980  
CCGGCAAACA AACCACCGCT GGTAGCGGTG GTTTTTTTGT TTGCAAGCAG CAGATTACGC 5040  
GCAGAAAAAA AGGATCTCAA GAAGATCCTT TGATCTTTTC TACGGGGTCT GACGCTCAGT 5100  
GGAACGAAAA CTCACGTAA GGGATTTTGG TCATGAGAT ATCAAAAAGG ATCTTCACCT 5160  
AGATCCTTTT AAATTAAAAA TGAAGTTTTA AATCAATGTA AAGTATATAT GAGTAACTT 5220  
GGTCTGACAG TTACCAATGC TTAATCAGTG AGGCACCTAT CTCAGCGATC TGTCTATTTT 5280  
GTTTCATCCAT AGTTGCCTGA CTCCCCGTCG TGTAAGATAAC TACGATACGG GAGGGCTTAC 5340  
CATCTGGCCC CAGTGCTGCA ATGATACCGC GAGACCCACG CTCACCGGCT CCAGATTTAT 5400  
CAGCAATAAA CCAGCCAGCC GGAAGGGCCG AGCGCAGAAG TGGTCTGCA ACTTTATCCG 5460  
CCTCCATCCA GTCTATTAAT TGTTGCCGGG AAGCTAGAGT AAGTAGTTTCG CCAGTTAATA 5520  
GTTTGCGCAA CGTTGTTGCC ATTGCTACAG GCATCGTGGT GTCACGCTCG TCGTTTGGTA 5580  
TGGCTTCATT CAGCTCCGGT TCCCAACGAT CAAGGCGAGT TACATGATCC CCCATGTTGT 5640

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GCAAAAAGC GGTTAGCTCC TTCGGTCCTC CGATCGTTGT CAGAAGTAAG TTGGCCGCAG 5700  
TGTTATCACT CATGGTTATG GCAGCACTGC ATAATTCTCT TACTGTCATG CCATCCGTAA 5760  
GATGCTTTTC TGTGACTGGT GAGTACTCAA CCAAGTCATT CTGAGAATAG TGTATGCGGC 5820  
GACCGAGTTG CTCTTGCCCG GCGTCAATAC GGGATAATAC CGCGCCACAT AGCAGAACTT 5880  
TAAAAGTGCT CATCATTGGA AAACGTTCTT CGGGGCGAAA ACTCTCAAGG ATCTTACCGC 5940  
TGTTGAGATC CAGTTCGATG TAACCCACTC GTGCACCCAA CTGATCTTCA GCATCTTTTA 6000  
CTTTCACCAG CGTTTCTGGG TGAGCAAAAA CAGGAAGGCA AAATGCCGCA AAAAAGGGAA 6060  
TAAGGGCGAC ACGGAAATGT TGAATACTCA TACTCTTCCT TTTCAATAT TATTGAAGCA 6120  
TTTATCAGGG TTATTGTCTC ATGAGCGGAT ACATATTTGA ATGTATTTAG AAAAATAAAC 6180  
AAATAGGGGT TCCGCGCACA TTTCCCCGAA AAGTGCCACC TGACGTCTAA GAAACCATTA 6240  
TTATCATGAC ATTAACCTAT AAAAATAGGC GTATCACGAG GCCCTTTCGT C 6291

## (2) INFORMATION FOR SEQ ID NO: 5:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 5560 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: double  
(D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: DNA (genomic)

## (iii) HYPOTHETICAL: NO

## (iv) ANTI-SENSE: NO

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: T-DNA of plasmid pTHW142

## (ix) FEATURE:

- (A) NAME/KEY: -  
(B) LOCATION: 1..25  
(D) OTHER INFORMATION: /label= RB

/note= "right border sequence of octopine TL-DNA from pTiB6S3"

## (ix) FEATURE:

- (A) NAME/KEY: -  
(B) LOCATION: complement (84..296)  
(D) OTHER INFORMATION: /label= 3'g7

/note= "3' untranslated region containing the polyadenylation signal of gene 7 of Agrobacterium T-DNA"

## (ix) FEATURE:



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(A) NAME/KEY: -  
(B) LOCATION:complement (318..869)  
(D) OTHER INFORMATION:/label= bar  
/note= "region coding for posphinotricin acetyl  
transferase"

(ix) FEATURE:  
(A) NAME/KEY: -  
(B) LOCATION:complement (830..2760)  
(D) OTHER INFORMATION:/label= PSSU  
/note= "promoter region of Rubisco small subunit gene of  
Arabidopsis thali..."

(ix) FEATURE:  
(A) NAME/KEY: -  
(B) LOCATION:complement (2765..3058)  
(D) OTHER INFORMATION:/label= 3'35S  
/note= "3' untranslated region of the CaMV 35S transcript  
containing polyadenylation signals"

(ix) FEATURE:  
(A) NAME/KEY: -  
(B) LOCATION:complement (3059..5056)  
(D) OTHER INFORMATION:/label= uidA  
/note= "region coding for beta-glucoronidase"

(ix) FEATURE:  
(A) NAME/KEY: -  
(B) LOCATION:complement (4483..4671)  
(D) OTHER INFORMATION:/label= IV2  
/note= "region corresponding to the second intron of the  
ST-LS1 gene"

(ix) FEATURE:  
(A) NAME/KEY: -  
(B) LOCATION:complement (5067..5502)  
(D) OTHER INFORMATION:/label= P35S  
/note= "35S promoter region of CaMV"

(ix) FEATURE:  
(A) NAME/KEY: -  
(B) LOCATION:5533..5560  
(D) OTHER INFORMATION:/label= LB  
/note= "left border sequence of octopine TL-DNA from  
pTIB6S3"

(ix) FEATURE:  
(A) NAME/KEY: -  
(B) LOCATION:5058..5059  
(D) OTHER INFORMATION:/note= "region with unknown  
sequence (may contain up to 20 nucleotides)"

(ix) FEATURE:  
(A) NAME/KEY: -

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(B) LOCATION:5077..5078

(D) OTHER INFORMATION:/note= "region with unknown  
sequence (may contain up to 20 nucleotides)"

## (ix) FEATURE:

(A) NAME/KEY: -

(B) LOCATION:5476..5479

(D) OTHER INFORMATION:/note= "region with unknown  
sequence (may contain up to 20 nucleotides)"

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 5:

AATTACAACG	GTATATATCC	TGCCAGTACT	CGGCCGTCGA	GTACATGGTC	GATAAGAAAA	60
GGCAATTTGT	AGATGTTAAT	TCCCATCTTG	AAAGAAATAT	AGTTTAAATA	TTTATTGATA	120
AAATAACAAG	TCAGGTATTA	TAGTCCAAGC	AAAAACATAA	ATTTATTGAT	GCAAGTTTAA	180
ATTCAGAAAT	ATTTCAATAA	CTGATTATAT	CAGCTGGTAC	ATTGCCGTAG	ATGAAAGACT	240
GAGTGCGATA	TTATGTGTAA	TACATAAATT	GATGATATAG	CTAGCTTAGC	TCATCGGGGG	300
ATCCTAGACG	CGTGAGATCA	GATCTCGGTG	ACGGGCAGGA	CCGGACGGGG	CGGTACCGGC	360
AGGCTGAAGT	CCAGCTGCCA	GAAACCCACG	TCATGCCAGT	TCCCGTGCTT	GAAGCCGGCC	420
GCCCCGAGCA	TGCCGCGGGG	GGCATATCCG	AGCGCCTCGT	GCATGCGCAC	GCTCGGGTCG	480
TTGGGCAGCC	CGATGACAGC	GACCACGCTC	TTGAAGCCCT	GTGCCTCCAG	GGACTTCAGC	540
AGGTGGGTGT	AGAGCGTGGA	GCCCAGTCCC	GTCCGCTGGT	GGCGGGGGGA	GACGTACACG	600
GTCGACTCGG	CCGTCCAGTC	GTAGGCGTTG	CGTGCCTTCC	AGGGGCCCCG	GTAGGCGATG	660
CCGGCGACCT	CGCCGTCCAC	CTCGGCGACG	AGCCAGGGAT	AGCGCTCCCG	CAGACGGACG	720
AGGTCGTCCG	TCCACTCCTG	CGGTTCTTGC	GGCTCGGTAC	GGAAGTTGAC	CGTGCTTGTC	780
TCGATGTAGT	GGTTGACGAT	GGTGACAGCC	GCCGGCATGT	CCGCCTCGGT	GGCACGGCGG	840
ATGTCGGCCG	GGCGTCGTTC	TGGGTCCATG	CAGTTAATTC	TTCCGCCGTT	GCTTGTGATG	900
GAAGTAATGT	CGTTGTTAGC	CTTGCGGGTG	GCTGGGAAGG	CAGCGGAGGA	CTTAAGTCCG	960
TTGAAAGGAG	CGACCATAGT	GGCCTGAGCC	GGAGAGGCAA	CCATAGTAGC	GGAAGAGAGC	1020
ATAGAGGAAG	CCATTGTTCT	TCTTTACTCT	TTGTGTGACT	GAGGTTTGGT	CTAGTGCTTT	1080
GGTCATCTAT	ATATAATGAT	AACAACAATG	AGAACAAGCT	TTGGAGTGAT	CGGAGGGTCT	1140
AGGATACATG	AGATTCAAGT	GGACTAGGAT	CTACACCGTT	GGATTTTGAG	TGTGGATATG	1200
TGTGAGGTTA	ATTTTACTTG	GTAACGGCCA	CAAAGGCCCTA	AGGAGAGGTG	TTGAGACCCT	1260

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5 TATCGGCTTG AACCGCTGGA ATAATGCCAC GTGGAAGATA ATTCCATGAA TCTTATCGTT 1320  
ATCTATGAGT GAAATTGTGT GATGGTGGAG TGGTGCTTGC TCATTTTACT TGCCTGGTGG 1380  
10 ACTTGGCCCT TTCCTTATGG GGAATTTATA TTTTACTTAC TATAGAGCTT TCATACCTTT 1440  
TTTTTACCTT GGATTTAGTT AATATATAAT GGTATGATTG ATGAATAAAA ATGGGAAATT 1500  
TTTGAATTTG TACTGCTAAA TGCATAAGAT TAGGTGAAAC TGTGGAATAT ATATTTTTTT 1560  
CATTTAAAAG CAAAATTTGC CTTTACTAG AATTATAAAT ATAGAAAAAT ATATAACATT 1620  
CAAATAAAAA TGAAAATAAG AACTTTCAAA AAACAGAACT ATGTTTAATG TGTAAAGATT 1680  
15 AGTCGCACAT CAAGTCATCT GTTACAATAT GTTACAACAA GTCATAAGCC CAACAAAGTT 1740  
AGCACGTCTA AATAAACTAA AGAGTCCACG AAAATATTAC AAATCATAAG CCCAACAAAG 1800  
TTATTGATCA AAAAAAAAAA ACGCCCAACA AAGCTAAACA AAGTCCAAAA AAACTTCTC 1860  
20 AAGTCTCCAT CTTCTTTTAT GAACATTGAA AACTATACAC AAAACAAGTC AGATAAATCT 1920  
CTTCTGGGC CTGTCTTCCC AACCTCCTAC ATCACTTCCC TATCGGATTG AATGTTTTAC 1980  
25 TTGTACCTTT TCCGTTGCAA TGATATTGAT AGTATGTTTG TGAAACTAA TAGGGTTAAC 2040  
AATCGAAGTC ATGGAATATG GATTTGGTCC AAGATTTTCC GAGAGCTTTC TAGTAGAAAG 2100  
CCCATCACCA GAAATTTACT AGTAAAATAA ATCACCAATT AGGTTTCTTA TTATGTGCCA 2160  
30 AATTCAATAT AATTATAGAG GATATTTCAA ATGAAAACGT ATGAATGTTA TTAGTAAATG 2220  
GTCAGGTAAG ACATTAAAAA AATCCTACGT CAGATATTCA ACTTTAAAAA TTCGATCAGT 2280  
35 GTGGAATTGT ACAAAAATTT GGGATCTACT ATATATATAT AATGCTTTAC AACACTTGGA 2340  
TTTTTTTTTG GAGGCTGGAA TTTTAAATCT ACATATTTGT TTTGGCCATG CACCAACTCA 2400  
TTGTTTAGTG TAATACTTTG ATTTTGTCOA ATATATGTGT TCGTGTATAT TTGTATAAGA 2460  
40 ATTTCTTTGA CCATATACAC ACACACATAT ATATATATAT ATATATATTA TATATCATGC 2520  
ACTTTTAATT GAAAAAATAA TATATATATA TATATCAT TTTTCTAAC AACCATATAT 2580  
45 GTTGCATTG ATCTGCAAAA ATACTGCTAG AGTAATGAAA AATAAATCT ATTGCTGAAA 2640  
TTATCTCAGA TGTAAAGATT TTCTAAAGT AAATTCTTTC AAATTTTAGC TAAAAGTCTT 2700  
GTAATAACTA AAGAATAATA CACAATCTCG ACCACGGAAT AAAACACAT AATAAATTTG 2760  
50 AATTAGCTTG CATGCCTGCA GGTCACCTGGA TTTTGGTTTT AGGAATTAGA AATTTTATTG 2820  
ATAGAAGTAT TTTACAAATA CAAATACATA CTAAGGGTTT CTTATATGCT CAACACATGA 2880  
55 GCGAAACCCT ATAAGAACCC TAATTCCTT ATCTGGGAAC TACTCACACA TTATTCTGGA 2940

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GA AAAAATAGA GAGAGATAGA TTTGTAGAGA GAGACTGGTG ATTTTGTGCGC CGGGTACCGA 3000  
GCTCGGTAGC AATTCCCAGAG GCTGTAGCCG ACGATGGTGC GCCAGGAGAG TTGTTGATTC 3060  
ATTGTTTGCC TCCCTGCTGC GGTTTTTTCAC CGAAGTTCAT GCCAGTCCAG CGTTTTTGTCA 3120  
GCAGAAAAGC CGCCGACTTC GGTTTTCGGT CGCGAGTGAA GATCCCTTTC TTGTTACCGC 3180  
CAACGCGCAA TATGCCTTGC GAGGTGCGAA AATCGGCGAA ATTCCATACC TGTTACCGA 3240  
CGACGGCGCT GACGCGATCA AAGACGCGGT GATACATATC CAGCCATGCA CACTGATACT 3300  
CTTCACTCCA CATGTCGGTG TACATTGAGT GCAGCCCGGC TAACGTATCC ACGCCGTATT 3360  
CGGTGATGAT AATCGGCTGA TGCAGTTTCT CCTGCCAGGC CAGAAGTTCT TTTTCCAGTA 3420  
CCTTCTCTGC CGTTTCCAAA TCGCCGCTTT GGACATACCA TCCGTAATAA CGGTTCAGGC 3480  
ACAGCACATC AAAGAGATCG CTGATGGTAT CGGTGTGAGC GTCGCAGAAC ATTACATTGA 3540  
CGCAGGTGAT CGGACGCGTC GGGTCGAGTT TACGCGTTGC TTCCGCCAGT GGCAGAAATAT 3600  
TCCCGTGCAC TTGCGGACGG GTATCCGGTT CGTTGGCAAT ACTCCACATC ACCACGCTTG 3660  
GGTGGTTTTT GTCACGCGCT ATCAGCTCTT TAATCGCCTG TAAGTGCCTG TGCTGAGTTT 3720  
CCCCGTTGAC TGCCTCTTCG CTGTACAGTT CTTTCGGCTT GTTGCCCGCT TCGAAACCAA 3780  
TGCCTAAAGA GAGGTTAAAG CCGACAGCAG CAGTTTCATC AATCACCACG ATGCCATGTT 3840  
CATCTGCCCCA GTCGAGCATC TCTTCAGCGT AAGGGTAATG CGAGGTACGG TAGGAGTTGG 3900  
CCCCAATCCA GTCCATTAAT GCGTGGTCGT GCACCATCAG CACGTTATCG AATCCTTTGC 3960  
CACGTAAGTC CGCATCTTCA TGACGACCAA AGCCAGTAAA GTAGAACGGT TTGTGGTTAA 4020  
TCAGGAACTG TTCGCCCTTC ACTGCCACTG ACCGGATGCC GACGCGAAGC GGGTAGATAT 4080  
CACACTCTGT CTGGCTTTTG GCTGTGACGC ACAGTTCTAT GAGATAACCT TCACCCGGTT 4140  
GCCAGAGGTG CGGATTCACC ACTTGCAAAG TCCCGCTAGT GCCTTGTCCA GTTGCAACCA 4200  
CCTGTTGATC CGCATCACGC AGTTCAACGC TGACATCACC ATTGGCCACC ACCTGCCAGT 4260  
CAACAGACGC GTGGTTACAG TCTTGCGCGA CATGCGTCAC CACGGTGATA TCGTCCACCC 4320  
AGGTGTTTCGG CGTGGTGTAG AGCATTACGC TGCGATGGAT TCCGGCATAG TTAAAGAAAT 4380  
CATGGAAGTA AGACTGCTTT TTCTTGCCGT TTTCGTCGGT AATCACCATT CCCGGCGGGA 4440  
TAGTCTGCCA GTTCAGTTTC TTGTTACAC AAACGGTGAT ACCTGCACAT CACCATGTTT 4500  
TGGT CATATA TTAGAAAAGT TATAAATTAA AATATACACA CTTATAAACT ACAGAAAAGC 4560

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5 AATTGCTATA TACTACATTC TTTTATTTTG AAAAAAATAT TTGAAATATT ATATTACTAC 4620  
TAATTAATGA TAATTATTAT ATATATATCA AAGGTAGAAG CAGAAACTTA CGTACACTTT 4680  
TCCCGGCAAT AACATACGGC GTGACATCGG CTTCAAATGG CGTATAGCCG CCCTGATGCT 4740  
CCATCACTTC CTGATTATTG ACCCAQACTT TGCCGTAATG AGTGACCGCA TCGAAACGCA 4800  
10 GCACGATACG CTGGCCTGCC CAACCTTTTCG GTATAAAGAC TTCGCGCTGA TACCAGACGT 4860  
TGCCCGCATA ATTACGAATA TCTGCATCGG CGAACTGATC GTTAAAACTG CCTGGCACAG 4920  
CAATTGCCCG GCTTTCTTGT AACGCGCTTT CCCACCAACG CTGATCAATT CCACAGTTTT 4980  
15 CGCGATCCAG ACTGAATGCC CACAGGCCGT CGAGTTTTTTT GATTTCACGG GTTGGGGTTT 5040  
CTACAGGACG GACCATGNNC CCGGGGATCC TCTAGANNTT ATAGAGAGAG AGATAGATTT 5100  
ATAGAGAGAG ACTGGTGATT TCAGCGTGTC CTCTCCAAAT GAAATGAACT TCCTTATATA 5160  
20 GAGGAAGGGT CTTGCGAAGG ATAGTGGGAT TGTCGTCAT CCCTTACGTC AGTGGAGATG 5220  
TCACATCAAT CCACTTGCTT TGAAGACGTG GTTGAACTT CTTCTTTTTC CACGATGCTC 5280  
25 CTCGTGGGTG GGGGTCCATC TTTGGGACCA CTGTCGSCAG AGGCATCTTG AATGATAGCC 5340  
TTTCCTTTAT CGCAATGATG GCATTTGTAG GAGCCACCTT CCTTTTCTAC TGTCCTTTTCG 5400  
30 ATGAAGTGAC AGATAGCTGG GCAATGGAAT CCGAGGAGGT TTCCCGAAAT TATCCTTTGT 5460  
TGAAAAGTCT CAATANNNG TCGACCTGCA GGCATGCAAG CTAATTCCGG GGAAGCTTAG 5520  
ATCCATGGAG CCATTTACAA TTGAATATAT CCTGCCGCCG 5560